Appendix C: Multimodal Corridor Design Matrix

Corridor Element Key		CORRIDOR MATRIX Multimodal System Design Guidelines - 2020 Update									
	Corridor Type ⇨	**Boulevard**									
	Intensity ⇨	**T-6**		**T-5**		**T-4**		**T-3**		**T-2**	
⇩	**Context Zones & Corridor Elements ⇩**	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM
	Building Context Zone										
A	BUILDING FRONTAGE ELEMENT	5 ft	3 ft	5 ft	3 ft	5 ft	2.5 ft	7 ft	1.5 ft	12 ft	1.5 ft
	Location of off street parking	rear	rear	rear	rear	rear	rear	rear	rear	rear	rear
	Typical building entry locations	front	front	front	front	front	front	front	front	front	front
	Roadway Edge Zone										
B	SIDEWALK THROUGH ELEMENT	10 ft	6 ft	10 ft	6 ft	8 ft	6 ft	6 ft	6 ft	6 ft	6 ft
C	AMENITY ELEMENT	8 ft	6 ft	8 ft	6 ft	8 ft	6 ft	8 ft	6 ft	9 ft	6 ft
	Surface Treatment for Amenity Element	Paved with tree wells		Paved with tree wells		Paved with tree wells		Paved with tree wells		Grassy strip with trees	
	Roadway Zone										
D	CURBSIDE ACTIVITY ELEMENT										
	PARALLEL PARKING ONLY	8 ft both sides	None	8 ft both sides	None	8 ft both sides	None	8 ft both sides	None	8 ft both sides	None
	FLEX ZONE: variable parallel parking, pick-up + drop-off, light delivery	10 ft [1]	8 ft	10 ft [1]	8 ft	10 ft [1]	8 ft	10 ft [1]	8 ft	10 ft [1]	8 ft
E	BICYCLE ELEMENT*										
	Non-Separated Conventional Bike Lane	5 - 8 ft [2]	4 - 5 ft [2]	5 - 8 ft [2]	4 - 5 ft [2]	5 - 8 ft [2]	4 - 5 ft [2]	5 - 8 ft [2]	4 - 5 ft [2]	5 - 8 ft [2]	4 - 5 ft [2]
	Non-Separated Buffered Bike Lane	9 - 10 ft [2]	6 - 8 ft [2]	9 - 10 ft [2]	6 - 8 ft [2]	9 - 10 ft [2]	6 - 8 ft [2]	9 - 10 ft [2]	6 - 8 ft [2]	9 - 10 ft [2]	6 - 8 ft [2]
	Further Guidance for Non-Separated Facilities	NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide	
	Separated Bike Lane (one-way)	10 ft [2]	6.5 - 8 ft [2]	10 ft [2]	6.5 - 8 ft [2]	10 ft [2]	6.5 - 8 ft [2]	10 ft [2]	6.5 - 8 ft [2]	10 ft [2]	6.5 - 8 ft [2]
	Separated Bike Lane (two-way)	15 ft [2]	9.5 - 11 ft [2]	15 ft [2]	9.5 - 11 ft [2]	15 ft [2]	9.5 - 11 ft [2]	15 ft [2]	9.5 - 11 ft [2]	15 ft [2]	9.5 - 11 ft [2]
	Further Guidance for Separated Facilities	FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide	
F	TRANSIT ELEMENT										
	Shared Transit Lane	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft
	Considerations	Low congestion		Low congestion		Low congestion		Low congestion		Low congestion	
	Dedicated Transit Lane	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft
	Considerations	High congestion		High congestion		High congestion		High congestion		High congestion	
	Further Guidance	NACTO Transit Street Design Guide		NACTO Transit Street Design Guide		NACTO Transit Street Design Guide		NACTO Transit Street Design Guide		NACTO Transit Street Design Guide	

The Multimodal Corridor Design Matrix shown here is from the Multimodal System Design Guidelines, published by the Virginia Department of Rail and Public Transportation.

CORRIDOR MATRIX

Multimodal System Design Guidelines - 2020 Update

Corridor Element Key	Corridor Type ⇨	Boulevard									
	Intensity ⇨	T-6		T-5		T-4		T-3		T-2	
⇩	Context Zones & Corridor Elements ⇩	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM
G	TRAVEL LANE ELEMENT	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]
	Design Speed	25 - 35 mph		25 - 35 mph		25 - 35 mph		25 - 35 mph		25 - 35 mph	
	Number of Through Lanes	4 to 6		4 to 6		4 to 6		4 to 6		2 to 6	
	Typical Traffic Volume Range (vehicles per day)	15,000 to 40,000		15,000 to 40,000		10,000 to 50,000		8,000 to 40,000		5,000 to 30,000	
	The following rows provide guidance on design speeds, lane widths, and number of though lanes from other guidebooks. This guidance was considered and incorporated in the values above, and is provided here for additional reference.										
	*2020 VDOT Road Design Manual***										
	Lane Widths	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]
	Design Speeds	30 - 40 mph		30 - 40 mph		30 - 40 mph		40 - 60 mph		40 - 60 mph	
	2018 AASHTO Green Book										
	Lane Widths	11 ft [5]	10 ft	11 ft [5]	10 ft	11 ft [5]	10 ft	11 ft [5]	10 ft	11 ft [5]	10 ft
	Design Speeds	30 mph OR LESS		30 mph OR LESS		25 - 45 mph		25 - 45 mph		20 - 45 mph	
	Number of Through Lanes	4 to 6		4 to 6		4 to 6		4 to 6		2 to 6	
	2013 NACTO Urban Street Design Guide							NACTO Urban Street Design Guidance is not applicable.		NACTO Urban Street Design Guidance is not applicable.	
	Lane Widths	11 ft [6]	10 ft	11 ft [6]	10 ft	11 ft [6]	10 ft				
	Design Speeds	35 mph or less		35 mph or less		35 mph or less					
H	MEDIAN ELEMENT	18 ft [4]	6 ft [4]	18 ft [4]	6 ft [4]	18 ft [4]	6 ft [4]	18 ft [4]	6 ft [4]	18 ft [4]	6 ft [4]

*The bicycle element treatments listed here are discussed in more detail in the **Corridor Matrix Annotation Document** (Appendix B of DRPT's Multimodal System Design Guidelines). Shared lane markings and bicycle boulevard features are other potential treatments appropriate for corridors with Bicycle Modal Emphasis. Refer to the NACTO Urban Bikeway Design Guide and the AASHTO Guide for the Development of Bicycle Facilities for design guidance on shared lane markings and bicycle boulevard features.

**The 2020 VDOT Road Design Manual is in concurrence with the 2011 AASHTO Green Book.

[1] Flexible zones are best accommodated within a 10-foot wide lane for brief but frequent pick-up and drop-off and-or delivery activities completed by a variety of different vehicle types. These activities can be accommodated within an 8-foot wide lane in cases where an existing roadway is not being reconstructed or where adjoining, land use, roadway geometry, traffic volumes and or lane widths are deemed accommodating to a narrower flex zone width.

[2] **Optimal and minimum values for the Bicycle Element are subject to other criteria including type of curb and gutter, on-street parking, posted/design speeds, average daily traffic volumes, bicycle volumes, frequency of parking turnover, and percentage of heavy vehicles**. These values represent general ranges of potentially feasible widths to determine if a facility might possibly fit within the available right-of-way. See the **Corridor Matrix Annotation Document** (Appendix B of DRPT's Multimodal System Design Guidelines) for more information on required widths in different circumstances.

[3] Travel lane width does not include the shy distance and curb or curb and gutter pan. Note: 12 ft is the optimum **only** for transit modal emphasis. Travel lane widths on Boulevards without transit modal emphasis should be minimized. (Refer to the **Corridor Matrix Annotation Document** for discussion.)

[4] Median element widths are measured from back of curb to back of curb. Median element widths do not include the width of the curb and shy distance.

[5] Section 7.3.3.2 of the 2018 AASHTO Green Book discusses considerations for lane widths on urban arterials. Lane widths may vary from 10 to 12 ft. 11-ft widths are normally adequate and have some advantages, but additional lane width may be desirable if substantial bus or truck traffic is anticipated.

[6] The NACTO Urban Street Design Guide indicates 11-foot lanes are only appropriate on designated truck or bus routes, and limited to one 11-foot lane in each direction. The NACTO USDG indicates 10-foot lanes are appropriate in all other instances.

The Multimodal Corridor Design Matrix shown here is from the Multimodal System Design Guidelines, published by the Virginia Department of Rail and Public Transportation.

CORRIDOR MATRIX

Multimodal System Design Guidelines - 2020 Update

Corridor Element Key		Major Avenue											
	Intensity ⇨	**T-6**		**T-5**		**T-4**		**T-3**		**T-2**		**T-1**	
⇩	**Context Zones & Corridor Elements** ⇩	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM
	Building Context Zone												
A	BUILDING FRONTAGE ELEMENT	7 ft	3 ft	7 ft	3 ft	7 ft	2.5 ft	7 ft	2.5 ft	12 ft	2 ft	12 ft	2 ft
	Location of off street parking	rear	rear	rear	rear	rear	side	rear	side	rear	side	rear	side
	Typical building entry locations	front	front	front	front	front	front	front	side	front	side	front	side
	Roadway Edge Zone												
B	SIDEWALK THROUGH ELEMENT	9 ft	6 ft	9 ft	6 ft	6 ft	6 ft	6 ft	6 ft	6 ft	5 ft	6 ft	5 ft
C	AMENITY ELEMENT	7 ft	6 ft	7 ft	6 ft	7 ft	6 ft	7 ft	6 ft	9 ft	6 ft	9 ft	6 ft
	Surface Treatment for Amenity Element	Paved with tree wells		Paved with tree wells		Paved with tree wells		Paved with tree wells		Grassy strip with trees		Grassy strip with trees	
	Roadway Zone												
D	CURBSIDE ACTIVITY ELEMENT												
	PARALLEL PARKING ONLY	8 ft both sides	None	8 ft both sides	None	8 ft both sides	None	8 ft both sides	None	8 ft both sides	None	8 ft both sides	None
	FLEX ZONE: variable parallel parking, pick-up + drop-off, light delivery	10 ft [1]	8 ft	10 ft [1]	8 ft	10 ft [1]	8 ft	10 ft [1]	8 ft	10 ft [1]	8 ft	10 ft [1]	8 ft
E	BICYCLE ELEMENT*												
	Non-Separated Conventional Bike Lane	5 - 8 ft [2]	4 - 5 ft [2]	5 - 8 ft [2]	4 - 5 ft [2]	5 - 8 ft [2]	4 - 5 ft [2]	5 - 8 ft [2]	4 - 5 ft [2]	5 - 8 ft [2]	4 - 5 ft [2]	5 - 8 ft [2]	4 - 5 ft [2]
	Non-Separated Buffered Bike Lane	9 - 10 ft [2]	6 - 8 ft [2]	9 - 10 ft [2]	6 - 8 ft [2]	9 - 10 ft [2]	6 - 8 ft [2]	9 - 10 ft [2]	6 - 8 ft [2]	9 - 10 ft [2]	6 - 8 ft [2]	9 - 10 ft [2]	6 - 8 ft [2]
	Further Guidance for Non-Separated Facilities	NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide	
	Separated Bike Lane (one-way)	10 ft [2]	6.5 - 8 ft [2]	10 ft [2]	6.5 - 8 ft [2]	10 ft [2]	6.5 - 8 ft [2]	10 ft [2]	6.5 - 8 ft [2]	10 ft [2]	6.5 - 8 ft [2]	10 ft [2]	6.5 - 8 ft [2]
	Separated Bike Lane (two-way)	15 ft [2]	9.5 - 11 ft [2]	15 ft [2]	9.5 - 11 ft [2]	15 ft [2]	9.5 - 11 ft [2]	15 ft [2]	9.5 - 11 ft [2]	15 ft [2]	9.5 - 11 ft [2]	15 ft [2]	9.5 - 11 ft [2]
	Further Guidance for Separated Facilities	FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide	
F	TRANSIT ELEMENT												
	Shared Transit Lane	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft
	Considerations	Low congestion		Low congestion		Low congestion		Low congestion		Low congestion		Low congestion	
	Dedicated Transit Lane	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft
	Considerations	High congestion		High congestion		High congestion		High congestion		High congestion		High congestion	
	Further Guidance	NACTO Transit Street Design Guide		NACTO Transit Street Design Guide		NACTO Transit Street Design Guide		NACTO Transit Street Design Guide		NACTO Transit Street Design Guide		NACTO Transit Street Design Guide	

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CORRIDOR MATRIX

Multimodal System Design Guidelines - 2020 Update

Corridor Element Key													
	Corridor Type ⇨	**Major Avenue**											
	Intensity ⇨	**T-6**		**T-5**		**T-4**		**T-3**		**T-2**		**T-1**	
⇩	**Context Zones & Corridor Elements ⇩**	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM
	TRAVEL LANE ELEMENT	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]
G	Design Speed	25 - 35 mph		25 - 35 mph		25 - 35 mph		25 - 35 mph		25 - 35 mph		25 - 35 mph	
G	Number of Through Lanes	2 to 4		2 to 4		2 to 4		2 to 4		2 to 4		2 to 4	
G	Typical Traffic Volume Range (vehicles per day)	10,000 to 30,000		8,000 to 25,000		5,000 to 25,000		5,000 to 20,000		2,000 to 10,000		2,000 to 10,000	
G	*The following rows provide guidance on design speeds, lane widths, and number of though lanes from other guidebooks. This guidance was considered and incorporated in the values above, and is provided here for additional reference.*												
G	*2020 VDOT Road Design Manual***												
G	*Lane Widths*	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]
G	*Design Speeds*	30 - 40 mph		30 - 40 mph		30 - 40 mph		30 - 60 mph		30 - 60 mph		30 - 60 mph	
G	*2018 AASHTO Green Book*												
G	*Lane Widths*	11 ft [5]	10 ft	11 ft [5]	10 ft	11 ft [5]	10 ft	11 ft [5]	10 ft	11 ft [5]	10 ft	11 ft [5]	10 ft
G	*Design Speeds*	35 mph OR LESS		35 mph OR LESS		25 - 45 mph		25 - 45 mph		45 mph OR LESS		45 mph OR LESS	
G	*Number of Through Lanes*	4 to 8		4 to 8		2 to 6		2 to 6		2 to 4		2 to 4	
G	*2013 NACTO Urban Street Design Guide*							NACTO Urban Street Design Guidance is not applicable.		NACTO Urban Street Design Guidance is not applicable.		NACTO Urban Street Design Guidance is not applicable.	
G	*Lane Widths*	11 ft [6]	10 ft	11 ft [6]	10 ft	11 ft [6]	10 ft						
G	*Design Speeds*	35 mph or less		35 mph or less		35 mph or less							
H	MEDIAN ELEMENT	18 ft [4]	None	18 ft [4]	None	18 ft [4]	None	18 ft [4]	None	18 ft [4]	None	18 ft [4]	None

*The bicycle element treatments listed here are discussed in more detail in the **Corridor Matrix Annotation Document** (Appendix B of DRPT's Multimodal System Design Guidelines). Shared lane markings and bicycle boulevard features are other potential treatments appropriate for corridors with Bicycle Modal Emphasis. Refer to the NACTO Urban Bikeway Design Guide and the AASHTO Guide for the Development of Bicycle Facilities for design guidance on shared lane markings and bicycle boulevard features.

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[1] Flexible zones are best accommodated within a 10-foot wide lane for brief but frequent pick-up and drop-off and-or delivery activities completed by a variety of different vehicle types. These activities can be accommodated within an 8-foot wide lane in cases where an existing roadway is not being reconstructed or where adjoining, land use, roadway geometry, traffic volumes and or lane widths are deemed accommodating to a narrower flex zone width.

[2] **Optimal and minimum values for the Bicycle Element are subject to other criteria including type of curb and gutter, on-street parking, posted/design speeds, average daily traffic volumes, bicycle volumes, frequency of parking turnover, and percentage of heavy vehicles.** These values represent general ranges of potentially feasible widths to determine if a facility might possibly fit within the available right-of-way. See the **Corridor Matrix Annotation Document** (Appendix B of DRPT's Multimodal System Design Guidelines) for more information on required widths in different circumstances.

[3] Travel lane width does not include the shy distance and curb or curb and gutter pan. Note: 12 ft is the optimum **only** for transit modal emphasis. Travel lane widths on Major Avenues without transit modal emphasis should be minimized. (Refer to the **Corridor Matrix Annotation Document** for discussion.)

[4] Median element widths are measured from back of curb to back of curb. Median element widths do not include the width of the curb and shy distance.

[5] Sections 6.3.2.1 and 7.3.3.2 of the 2018 AASHTO Green Book discuss considerations for lane widths on urban collectors and urban arterials, respectively. Lane widths may vary from 10 to 12 ft. 11-ft widths are normally adequate and have some advantages, but additional lane width may be desirable if substantial bus or truck traffic is anticipated.

[6] The NACTO Urban Street Design Guide indicates 11-foot lanes are only appropriate on designated truck or bus routes, and limited to one 11-foot lane in each direction. The NACTO USDG indicates 10-foot lanes are appropriate in all other instances.

The Multimodal Corridor Design Matrix shown here is from the Multimodal System Design Guidelines, published by the Virginia Department of Rail and Public Transportation.

CORRIDOR MATRIX

Multimodal System Design Guidelines - 2020 Update

Corridor Element Key		Avenue											
	Corridor Type ⇨												
	Intensity ⇨	T-6		T-5		T-4		T-3		T-2		T-1	
⇩	**Context Zones & Corridor Elements** ⇩	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM
	Building Context Zone												
A	BUILDING FRONTAGE ELEMENT	8 ft	2.5 ft	8 ft	2.5 ft	8 ft	2.5 ft	10 ft	1.5 ft	15 ft	1.5 ft	15 ft	1.5 ft
	Location of off street parking	rear	rear	rear	rear	rear	side	rear	side	rear	side	rear	side
	Typical building entry locations	front	front	front	front	front	front	front	side	front	side	front	side
	Roadway Edge Zone												
B	SIDEWALK THROUGH ELEMENT	8 ft	5 ft	7 ft	5 ft	6 ft	5 ft	6 ft	5 ft	6 ft	5 ft	6 ft	5 ft
C	AMENITY ELEMENT	7 ft	6 ft	7 ft	6 ft	7 ft	6 ft	7 ft	6 ft	8 ft	6 ft	7 ft	6 ft
	Surface Treatment for Amenity Element	Paved with tree wells		Paved with tree wells		Paved with tree wells		Paved with tree wells		Grassy strip with trees		Grassy strip with trees	
	Roadway Zone												
D	CURBSIDE ACTIVITY ELEMENT												
	PARALLEL PARKING ONLY	8 ft both sides	None	8 ft both sides	None	8 ft both sides	None	7 ft both sides	None	7 ft both sides	None	7 ft both sides	None
	FLEX ZONE: variable parallel parking, pick-up + drop-off, light delivery	10 ft [1]	8 ft	10 ft [1]	8 ft	10 ft [1]	8 ft	10 ft [1]	8 ft	10 ft [1]	8 ft	10 ft [1]	8 ft
E	BICYCLE ELEMENT*												
	Non-Separated Conventional Bike Lane	5 - 8 ft [2]	4 - 5 ft [2]	5 - 8 ft [2]	4 - 5 ft [2]	5 - 8 ft [2]	4 - 5 ft [2]	5 - 8 ft [2]	4 - 5 ft [2]	5 - 8 ft [2]	4 - 5 ft [2]	5 - 8 ft [2]	4 - 5 ft [2]
	Non-Separated Buffered Bike Lane	9 - 10 ft [2]	6 - 8 ft [2]	9 - 10 ft [2]	6 - 8 ft [2]	9 - 10 ft [2]	6 - 8 ft [2]	9 - 10 ft [2]	6 - 8 ft [2]	9 - 10 ft [2]	6 - 8 ft [2]	9 - 10 ft [2]	6 - 8 ft [2]
	Further Guidance for Non-Separated Facilities	NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide	
	Separated Bike Lane (one-way)	10 ft [2]	6.5 - 8 ft [2]	10 ft [2]	6.5 - 8 ft [2]	10 ft [2]	6.5 - 8 ft [2]	10 ft [2]	6.5 - 8 ft [2]	10 ft [2]	6.5 - 8 ft [2]	10 ft [2]	6.5 - 8 ft [2]
	Separated Bike Lane (two-way)	15 ft [2]	9.5 - 11 ft [2]	15 ft [2]	9.5 - 11 ft [2]	15 ft [2]	9.5 - 11 ft [2]	15 ft [2]	9.5 - 11 ft [2]	15 ft [2]	9.5 - 11 ft [2]	15 ft [2]	9.5 - 11 ft [2]
	Further Guidance for Separated Facilities	FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide	
F	TRANSIT ELEMENT												
	Shared Transit Lane	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft
	Considerations	Low congestion		Low congestion		Low congestion		Low congestion		Low congestion		Low congestion	
	Dedicated Transit Lane	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft
	Considerations	High congestion		High congestion		High congestion		High congestion		High congestion		High congestion	
	Further Guidance	NACTO Transit Street Design Guide		NACTO Transit Street Design Guide		NACTO Transit Street Design Guide		NACTO Transit Street Design Guide		NACTO Transit Street Design Guide		NACTO Transit Street Design Guide	

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CORRIDOR MATRIX

Multimodal System Design Guidelines - 2020 Update

Corridor Element Key													
	Corridor Type ⇨	**Avenue**											
	Intensity ⇨	**T-6**		**T-5**		**T-4**		**T-3**		**T-2**		**T-1**	
⇩	**Context Zones & Corridor Elements ⇩**	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM
	TRAVEL LANE ELEMENT	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]
G	Design Speed	25-30 mph		25-30 mph		25-30 mph		25-30 mph		25-30 mph		25-30 mph	
	Number of Through Lanes	2 to 4		2 to 4		2 to 4		2 to 4		2 to 4		2 to 4	
	Typical Traffic Volume Range (vehicles per day)	2,000 to 20,000		2,000 to 15,000		1,500 to 10,000		1,000 to 10,000		1,000 to 5,000		1,000 to 5,000	
	The following rows provide guidance on design speeds, lane widths, and number of though lanes from other guidebooks. This guidance was considered and incorporated in the values above, and is provided here for additional reference.												
	*2020 VDOT Road Design Manual***												
	Lane Widths	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]	12 ft [3]	11 ft [3]
	Design Speeds	20 - 40 mph		20 - 40 mph		20 - 40 mph		20 - 60 mph		20 - 60 mph		20 - 60 mph	
	2018 AASHTO Green Book												
	Lane Widths	11 ft [5]	10 ft	11 ft [5]	10 ft	11 ft [5]	10 ft	11 ft [5]	10 ft	11 ft [5]	10 ft	11 ft [5]	10 ft
	Design Speeds	35 mph OR LESS		35 mph OR LESS		20 - 45 mph		20 - 45 mph		45 mph OR LESS		45 mph OR LESS	
	Number of Through Lanes	4 to 8		4 to 8		2 to 6		2 to 6		2 to 4		2 to 4	
	2013 NACTO Urban Street Design Guide							NACTO Urban Street Design Guidance is not applicable.		NACTO Urban Street Design Guidance is not applicable.		NACTO Urban Street Design Guidance is not applicable.	
	Lane Widths	11 ft [6]	10 ft	11 ft [6]	10 ft	11 ft [6]	10 ft						
	Design Speeds	30 mph or less		30 mph or less		30 mph or less							
H	MEDIAN ELEMENT	18 ft [4]	None	18 ft [4]	None	18 ft [4]	None	18 ft [4]	None	18 ft [4]	None	18 ft [4]	None

*The bicycle element treatments listed here are discussed in more detail in the **Corridor Matrix Annotation Document** (Appendix B of DRPT's Multimodal System Design Guidelines). Shared lane markings and bicycle boulevard features are other potential treatments appropriate for corridors with Bicycle Modal Emphasis. Refer to the NACTO Urban Bikeway Design Guide and the AASHTO Guide for the Development of Bicycle Facilities for design guidance on shared lane markings and bicycle boulevard features.

**The 2020 VDOT Road Design Manual is in concurrence with the 2011 AASHTO Green Book.

[1] Flexible zones are best accommodated within a 10-foot wide lane for brief but frequent pick-up and drop-off and-or delivery activities completed by a variety of different vehicle types. These activities can be accommodated within an 8-foot wide lane in cases where an existing roadway is not being reconstructed or where adjoining, land use, roadway geometry, traffic volumes and or lane widths are deemed accommodating to a narrower flex zone width.

[2] **Optimal and minimum values for the Bicycle Element are subject to other criteria including type of curb and gutter, on-street parking, posted/design speeds, average daily traffic volumes, bicycle volumes, frequency of parking turnover, and percentage of heavy vehicles.** These values represent general ranges of potentially feasible widths to determine if a facility might possibly fit within the available right-of-way. See the **Corridor Matrix Annotation Document** (Appendix B of DRPT's Multimodal System Design Guidelines) for more information on required widths in different circumstances.

[3] Travel lane width does not include the shy distance and curb or curb and gutter pan. Note: 12 ft is the optimum **only** for transit modal emphasis. Travel lane widths on Avenues without transit modal emphasis should be minimized. (Refer to the **Corridor Matrix Annotation Document** for discussion.)

[4] Median element widths are measured from back of curb to back of curb. Median element widths do not include the width of the curb and shy distance.

[5] Sections 6.3.2.1 and 7.3.3.2 of the 2018 AASHTO Green Book discuss considerations for lane widths on urban collectors and urban arterials, respectively. Lane widths may vary from 10 to 12 ft. 11-ft widths are normally adequate and have some advantages, but additional lane width may be desirable if substantial bus or truck traffic is anticipated.

[6] The NACTO Urban Street Design Guide indicates 11-foot lanes are only appropriate on designated truck or bus routes, and limited to one 11-foot lane in each direction. The NACTO USDG indicates 10-foot lanes are appropriate in all other instances.

The Multimodal Corridor Design Matrix shown here is from the Multimodal System Design Guidelines, published by the Virginia Department of Rail and Public Transportation.

CORRIDOR MATRIX

Multimodal System Design Guidelines - 2020 Update

Corridor Element Key		Local Street											
	Corridor Type ⇨												
	Intensity ⇨	T-6		T-5		T-4		T-3		T-2		T-1	
⇩	**Context Zones & Corridor Elements** ⇩	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM
	Building Context Zone												
A	BUILDING FRONTAGE ELEMENT	8 ft	2.5 ft	8 ft	2.5 ft	8 ft	2.5 ft	15 ft	1.5 ft	20 ft	1.5 ft	30 ft	1.5 ft
	Location of off street parking	rear	rear	rear	rear	rear	rear	rear	side	rear	side	rear	side
	Typical building entry locations	front	front	front	front	front	front	front	side	front	side	front	side
	Roadway Edge Zone												
B	SIDEWALK THROUGH ELEMENT	6 ft	5 ft	6 ft	5 ft	6 ft	5 ft	6 ft	5 ft	5 ft	5 ft	5 ft	5 ft
C	AMENITY ELEMENT	7 ft	6 ft	7 ft	6 ft	7 ft	6 ft	7 ft	6 ft	6 ft	6 ft	6 ft	6 ft
	Surface Treatment for Amenity Element	Paved with tree wells		Paved with tree wells		Paved with tree wells		Paved with tree wells		Grassy strip with trees		Grassy strip with trees	
	Roadway Zone												
D	CURBSIDE ACTIVITY ELEMENT												
	PARALLEL PARKING ONLY	7 ft both sides	None	7 ft both sides	None	7 ft both sides	None	7 ft both sides	None	7 ft both sides	None	7 ft both sides	None
	FLEX ZONE: variable parallel parking, pick-up + drop-off, light delivery	8 ft	7 ft	8 ft	7 ft	8 ft	7 ft	8 ft	7 ft	8 ft	7 ft	8 ft	7 ft
E	BICYCLE ELEMENT*												
	Non-Separated Conventional Bike Lane	5 - 8 ft [1]	4 - 5 ft [1]	5 - 8 ft [1]	4 - 5 ft [1]	5 - 8 ft [1]	4 - 5 ft [1]	5 - 8 ft [1]	4 - 5 ft [1]	5 - 8 ft [1]	4 - 5 ft [1]	5 - 8 ft [1]	4 - 5 ft [1]
	Non-Separated Buffered Bike Lane	9 - 10 ft [1]	6 - 8 ft [1]	9 - 10 ft [1]	6 - 8 ft [1]	9 - 10 ft [1]	6 - 8 ft [1]	9 - 10 ft [1]	6 - 8 ft [1]	9 - 10 ft [1]	6 - 8 ft [1]	9 - 10 ft [1]	6 - 8 ft [1]
	Further Guidance for Non-Separated Facilities	NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide	
	Separated Bike Lane (one-way)	10 ft [1]	6.5 - 8 ft [1]	10 ft [1]	6.5 - 8 ft [1]	10 ft [1]	6.5 - 8 ft [1]	10 ft [1]	6.5 - 8 ft [1]	10 ft [1]	6.5 - 8 ft [1]	10 ft [1]	6.5 - 8 ft [1]
	Separated Bike Lane (two-way)	15 ft [1]	9.5 - 11 ft [1]	15 ft [1]	9.5 - 11 ft [1]	15 ft [1]	9.5 - 11 ft [1]	15 ft [1]	9.5 - 11 ft [1]	15 ft [1]	9.5 - 11 ft [1]	15 ft [1]	9.5 - 11 ft [1]
	Further Guidance for Separated Facilities	FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide	
F	TRANSIT ELEMENT												
	Shared Transit Lane	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft
	Considerations	Low congestion		Low congestion		Low congestion		Low congestion		Low congestion		Low congestion	
	Dedicated Transit Lane	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	*Not Recommended*		*Not Recommended*	
	Considerations	High congestion		High congestion		High congestion		High congestion					
	Further Guidance	NACTO Transit Street Design Guide		NACTO Transit Street Design Guide		NACTO Transit Street Design Guide		NACTO Transit Street Design Guide		NACTO Transit Street Design Guide		NACTO Transit Street Design Guide	

The Multimodal Corridor Design Matrix shown here is from the Multimodal System Design Guidelines, published by the Virginia Department of Rail and Public Transportation.

CORRIDOR MATRIX

Multimodal System Design Guidelines - 2020 Update

Corridor Element Key													
	Corridor Type ⇨	**Local Street**											
	Intensity ⇨	**T-6**		**T-5**		**T-4**		**T-3**		**T-2**		**T-1**	
⇩	**Context Zones & Corridor Elements ⇩**	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM
	TRAVEL LANE ELEMENT	11 ft [2]	10 ft [2]	11 ft [2]	10 ft [2]	11 ft [2]	10 ft [2]	11 ft [2]	10 ft [2]	11 ft [2]	10 ft [2]	11 ft [2]	10 ft [2]
G	Design Speed	25 mph		25 mph		25 mph		25 mph		25 mph		25 mph	
	Number of Through Lanes	2 to 4		2 to 4		2		2		2		2	
	Typical Traffic Volume Range (vehicles per day)	less than 10,000		less than 10,000		less than 8,000		less than 5,000		less than 2,000		less than 2,000	
	The following rows provide guidance on design speeds, lane widths, and number of though lanes from other guidebooks. This guidance was considered and incorporated in the values above, and is provided here for additional reference.												
	*2020 VDOT Road Design Manual***												
	Lane Widths	11 ft [2]	10 ft [2]	11 ft [2]	10 ft [2]	11 ft [2]	10 ft [2]	11 ft [2]	10 ft [2]	11 ft [2]	10 ft [2]	11 ft [2]	10 ft [2]
	Design Speeds	20-30 mph		20-30 mph		20-30 mph		20-30 mph		20-30 mph		20-30 mph	
	2018 AASHTO Green Book												
	Lane Widths	11 ft [3]	10 ft [3]	11 ft [3]	10 ft [3]	11 ft [3]	10 ft [3]	11 ft [3]	10 ft [3]	11 ft [3]	10 ft [3]	11 ft [3]	10 ft [3]
	Design Speeds	20 - 30 mph		20 - 30 mph		20 - 30 mph		20 - 30 mph		20 - 30 mph		20 - 30 mph	
	Number of Through Lanes	2 to 4		2 to 4		2		2		2		2	
	2013 NACTO Urban Street Design Guide							NACTO Urban Street Design Guidance is not applicable.		NACTO Urban Street Design Guidance is not applicable.		NACTO Urban Street Design Guidance is not applicable.	
	Lane Widths	11 ft [4]	10 ft	11 ft [4]	10 ft	11 ft [4]	10 ft						
	Design Speeds	30 mph or less		30 mph or less		30 mph or less							
H	MEDIAN ELEMENT	None	None	None	None	None	None	None	None	None	None	None	None

*The bicycle element treatments listed here are discussed in more detail in the **Corridor Matrix Annotation Document** (Appendix B of DRPT's Multimodal System Design Guidelines). Shared lane markings and bicycle boulevard features are other potential treatments appropriate for corridors with Bicycle Modal Emphasis. Refer to the NACTO Urban Bikeway Design Guide and the AASHTO Guide for the Development of Bicycle Facilities for design guidance on shared lane markings and bicycle boulevard features.

**The 2020 VDOT Road Design Manual is in concurrence with the 2011 AASHTO Green Book.

[1] **Optimal and minimum values for the Bicycle Element are subject to other criteria including type of curb and gutter, on-street parking, posted/design speeds, average daily traffic volumes, bicycle volumes, frequency of parking turnover, and percentage of heavy vehicles.** These values represent general ranges of potentially feasible widths to determine if a facility might possibly fit within the available right-of-way. See the **Corridor Matrix Annotation Document** (Appendix B of DRPT's Multimodal System Design Guidelines) for more information on required widths in different circumstances.

[2] Travel lane width does not include the shy distance and curb or curb and gutter pan.

[3] Section 5.3.2.1 of the 2018 AASHTO Green Book discusses considerations for lane widths on local streets in urban areas. Lanes should preferably be 10 to 11 ft wide. Where the available or attainable width of right-of-way imposes severe limitations, 9-ft lanes can be used in residential areas.

[4] The NACTO Urban Street Design Guide indicates 11-foot lanes are only appropriate on designated truck or bus routes, and limited to one 11-foot lane in each direction. The NACTO USDG indicates 10-foot lanes are appropriate in all other instances.

The Multimodal Corridor Design Matrix shown here is from the Multimodal System Design Guidelines, published by the Virginia Department of Rail and Public Transportation.

CORRIDOR MATRIX

Multimodal System Design Guidelines - 2020 Update

Corridor Element Key		Multimodal Through Corridor											
	Intensity ⇨	**T-6**		**T-5**		**T-4**		**T-3**		**T-2**		**T-1**	
⇩	**Context Zones & Corridor Elements** ⇩	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM
	Building Context Zone												
A	BUILDING FRONTAGE ELEMENT	15 to 25 ft	10 ft	15 to 25 ft	10 ft	20 to 35 ft	15 ft	25 to 35 ft	15 ft	30 to 45 ft	20 ft	30 to 45 ft	20 ft
	Location of off street parking	rear	front	rear	front	rear	front	rear	front	rear	front	rear	front
	Typical building entry locations	front/side	rear	front/side	rear	front/side	rear	front/side	rear	front/side	rear	front/side	rear
	Roadway Edge Zone												
B	SIDEWALK THROUGH ELEMENT	14 ft shared use path	5 ft sidewalk	14 ft shared use path	5 ft sidewalk	12 ft shared use path	5 ft sidewalk	12 ft shared use path	5 ft sidewalk	10 ft shared use path	5 ft sidewalk	10 ft shared use path	5 ft sidewalk
C	AMENITY ELEMENT	A minimum of 8 feet width is necessary between the face of the curb and the edge of the shared use path. Physical barriers, such as dense shrubbery, railings, or fencing may be placed between travel lanes and shared use path.								Shoulder and drainage ditch recommended instead of curb and gutter. Width between travel lanes and shared use path varies depending on speed. 20 to 28 ft for 60 mph design speed. 14 to 22 ft for 50 mph design speed.			
	Surface Treatment for Amenity Element												
	Roadway Zone												
D	CURBSIDE ACTIVITY ELEMENT												
	PARALLEL PARKING ONLY	On Street Parking Prohibited	On Street Parking Prohibited	On Street Parking Prohibited	On Street Parking Prohibited	On Street Parking Prohibited	On Street Parking Prohibited	On Street Parking Prohibited	On Street Parking Prohibited	On Street Parking Prohibited	On Street Parking Prohibited	On Street Parking Prohibited	On Street Parking Prohibited
	FLEX ZONE: variable parallel parking, pick-up + drop-off, light delivery	Flex zone not permitted		Flex zone not permitted		Flex zone not permitted		Flex zone not permitted		Flex zone not permitted		On Street Parking Prohibited	
E	BICYCLE ELEMENT*												
	Non-Separated Conventional Bike Lane	5 - 8 ft [1]	4 - 5 ft [1]	5 - 8 ft [1]	4 - 5 ft [1]	5 - 8 ft [1]	4 - 5 ft [1]	5 - 8 ft [1]	4 - 5 ft [1]	5 - 8 ft [1]	4 - 5 ft [1]	5 - 8 ft [1]	4 - 5 ft [1]
	Non-Separated Buffered Bike Lane	9 - 10 ft [1]	6 - 8 ft [1]	9 - 10 ft [1]	6 - 8 ft [1]	9 - 10 ft [1]	6 - 8 ft [1]	9 - 10 ft [1]	6 - 8 ft [1]	9 - 10 ft [1]	6 - 8 ft [1]	9 - 10 ft [1]	6 - 8 ft [1]
	Further Guidance for Non-Separated Facilities	NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide		NACTO Urban Bikeway Design Guide	
	Separated Bike Lane (one-way)	10 ft [1]	6.5 - 8 ft [1]	10 ft [1]	6.5 - 8 ft [1]	10 ft [1]	6.5 - 8 ft [1]	10 ft [1]	6.5 - 8 ft [1]	10 ft [1]	6.5 - 8 ft [1]	10 ft [1]	6.5 - 8 ft [1]
	Separated Bike Lane (two-way)	15 ft [1]	9.5 - 11 ft [1]	15 ft [1]	9.5 - 11 ft [1]	15 ft [1]	9.5 - 11 ft [1]	15 ft [1]	9.5 - 11 ft [1]	15 ft [1]	9.5 - 11 ft [1]	15 ft [1]	9.5 - 11 ft [1]
	Further Guidance for Separated Facilities	FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide		FHWA Separated Bike Lane Planning and Design Guide	
F	TRANSIT ELEMENT												
	Shared Transit Lane	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft
	Considerations	Low congestion		Low congestion		Low congestion		Low congestion		Low congestion		Low congestion	
	Dedicated Transit Lane	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft	12 ft	11 ft
	Considerations	High congestion		High congestion		High congestion		High congestion		High congestion		High congestion	
	Further Guidance	NACTO Transit Street Design Guide		NACTO Transit Street Design Guide		NACTO Transit Street Design Guide		NACTO Transit Street Design Guide		NACTO Transit Street Design Guide		NACTO Transit Street Design Guide	

The Multimodal Corridor Design Matrix shown here is from the Multimodal System Design Guidelines, published by the Virginia Department of Rail and Public Transportation.

CORRIDOR MATRIX

Multimodal System Design Guidelines - 2020 Update

Corridor Element Key		Multimodal Through Corridor											
	Intensity ⇨	**T-6**		**T-5**		**T-4**		**T-3**		**T-2**		**T-1**	
⇩	**Context Zones & Corridor Elements** ⇩	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM	OPTIMAL	MINIMUM
	TRAVEL LANE ELEMENT	12 ft [2]	11 ft [2]	12 ft [2]	11 ft [2]	12 ft [2]	11 ft [2]	12 ft [2]	11 ft [2]	12 ft [2]	12 ft [2]	12 ft [2]	12 ft [2]
G	Design Speed	35 - 45 mph		35 - 45 mph		35 - 45 mph		35 - 55 mph		45 - 55 mph		45 - 55 mph	
	Number of Through Lanes	4 to 6		4 to 6		4 to 6		2 to 4		2 to 4		2 to 4	
	Typical Traffic Volume Range (vehicles per day)	20,000 to 60,000		20,000 to 50,000		15,000 to 40,000		10,000 to 30,000		5,000 to 20,000		2,000 to 20,000	
	The following rows provide guidance on design speeds, lane widths, and number of though lanes from other guidebooks. This guidance was considered and incorporated in the values above, and is provided here for additional reference.												
	*2020 VDOT Road Design Manual***												
	Lane Widths	12 ft [2]	11 ft [2]	12 ft [2]	11 ft [2]	12 ft [2]	11 ft [2]	12 ft [2]	11 ft [2]	12 ft [2]	12 ft [2]	12 ft [2]	12 ft [2]
	Design Speeds	30 - 70 mph		30 - 70 mph		30 - 70 mph		30 - 70 mph		30 - 70 mph		30 - 70 mph	
	2018 AASHTO Green Book												
	Lane Widths	12 ft [5]	10 ft [6]	12 ft [5]	10 ft [6]	12 ft [5]	10 ft [6]	12 ft [5]	10 ft [6]	12 ft [5]	10 ft [6]	12 ft	12 ft
	Design Speeds	30 mph OR LESS		30 mph OR LESS		25 - 45 mph		25 - 45 mph		30 - 55 mph		40 - 75 mph	
	Number of Through Lanes	4 to 8		4 to 8		4 to 6		4 to 6		2 to 4		2 to 4	
	2013 NACTO Urban Street Design Guide							NACTO Urban Street Design Guidance is not applicable.		NACTO Urban Street Design Guidance is not applicable.		NACTO Urban Street Design Guidance is not applicable.	
	Lane Widths	11 ft [7]	10 ft	11 ft [7]	10 ft	11 ft [7]	10 ft						
	Design Speeds	35 mph or less		35 mph or less		35 mph or less							
H	MEDIAN ELEMENT	18 ft [3],[4]	17 Ft [3],[4]	18 ft [3],[4]	17 Ft [3],[4]	18 ft [3],[4]	17 Ft [3],[4]	18 ft [3],[4]	None	40 ft[4]	None	40 ft[4]	None

*The bicycle element treatments listed here are discussed in more detail in the **Corridor Matrix Annotation Document** (Appendix B of DRPT's Multimodal System Design Guidelines). Shared lane markings and bicycle boulevard features are other potential treatments appropriate for corridors with Bicycle Modal Emphasis. Refer to the NACTO Urban Bikeway Design Guide and the AASHTO Guide for the Development of Bicycle Facilities for design guidance on shared lane markings and bicycle boulevard features.

**The 2020 VDOT Road Design Manual is in concurrence with the 2011 AASHTO Green Book.

[1] **Optimal and minimum values for the Bicycle Element are subject to other criteria including type of curb and gutter, on-street parking, posted/design speeds, average daily traffic volumes, bicycle volumes, frequency of parking turnover, and percentage of heavy vehicles.** These values represent general ranges of potentially feasible widths to determine if a facility might possibly fit within the available right-of-way. See the **Corridor Matrix Annotation Document** (Appendix B of DRPT's Multimodal System Design Guidelines) for more information on required widths in different circumstances.

[2] Travel lane width does not include the shy distance and curb or curb and gutter pan.

[3] Median element widths are measured from back of curb to back of curb. Median element widths do not include the width of the curb and shy distance.

[4] Median width does not include accommodation for transit in the median. If transit runs in the median, the width will vary based upon detailed design.

[5] Section 7.3.3.2 of the 2018 AASHTO Green Book discusses considerations for lane widths on arterials in urban areas. Lane widths may vary from 10 to 12 ft. The 12-ft lane widths are desirable, where practical on high-speed, free-flowing, principal arterials. However, Section 7.3.2.1 indicates design speeds for arterials are generally 30 mph or less in the urban core context, 25 to 45 mph in the urban context, and 30 to 55 mph in the suburban context.

[6] 10-ft widths may be used if speeds are less than 35 mph and truck and bus volumes are relatively low. (Section 7.3.3.2 in 2018 AASHTO Green Book)

[7] The NACTO Urban Street Design Guide indicates 11-foot lanes are only appropriate on designated truck or bus routes, and limited to one 11-foot lane in each direction. The NACTO USDG indicates 10-foot lanes are appropriate in all other instances.

The Multimodal Corridor Design Matrix shown here is from the Multimodal System Design Guidelines, published by the Virginia Department of Rail and Public Transportation.